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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/483,737	01/14/2000	Hansjorg Reichert	GR-97-P-1903	8769

7590 02/11/2003

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EXAMINER

SEFER, AHMED N

ART UNIT

PAPER NUMBER

2826

DATE MAILED: 02/11/2003

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09 483,737

APPLICATION NO./ 09/483,737 CONTROL NO.	FILING DATE 1/14/2000	FIRST NAMED INVENTOR / REICHERT ET AL PATENT IN REEXAMINATION	ATTORNEY DOCKET NO. GR 97 P 1903
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EXAMINER

A. SEFER

ART UNIT	PAPER
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2826

19

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The IDS disclosed in Paper No. 5 and Paper No. 18 has been considered.



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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Paper No. 19

Application Number: 09/483,737

Filing Date: January 14, 2000

Appellant(s): REICHERT ET AL.

\_\_\_\_\_  
Laurence A. Greenberg

For Appellant  
\_\_\_\_\_

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 11-13-02

**(1) *Real Party in Interest***

A statement identifying the real party in interest is contained in the brief.

**(2) *Related Appeals and Interferences***

The brief does not contain a statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief. Therefore, it is presumed that there are none. The Board, however, may exercise its discretion to require an explicit statement as to the existence of any related appeals and interferences.

**(3) *Status of Claims***

The statement of the status of the claims contained in the brief is correct.

**(4) *Status of Amendments After Final***

No amendment after final has been filed.

**(5) *Summary of Invention***

The summary of invention contained in the brief is correct.

**(6) *Issues***

The appellant's statement of the issues in the brief is correct.

**(7) *Grouping of Claims***

The rejection of claims 15 and 17 stand or fall together as stated in the brief.

**(8) *Claims Appealed***

The copy of the appealed claims contained in the Appendix to the brief is correct.

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**(9) Prior Art of Record**

JP 6-291239	Patent	10 -94
JP 2-15897	Patent	1-90
US 5,234,153	Patent	8-93

**(10) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claims 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamagishi et al. (JP 6-291239) in view of Komata et al (JP 2-15897) and Bacon et al. US Patent No. 5,234,153.

Yamagishi et al disclose in fig. 1c a solder containing at least two components with at least two constituents including a first constituent containing a precious metal and a second constituent being consumed during a soldering operation by one of reacting and being dissolved in material which are to be joined; a substrate 1; and a semiconductor chip 4 secured to said substrate by one of alloying and brazing using said solder.

Komata et al a precious metal and tin solder 13 and said solder has a hypereutectic concentration containing gold-tin (AuSn) with a hypereutectic Sn concentration.

Bacon et al. teach (see abstract and claim 7) the advantage of using a thin gold-tin compound solder.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to replace the Au-Sn eutectic alloy of Yamagishi et al with a

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hypereutectic Sn concentration of Komata et al, since that would prevent deformation thereby enhancing the mechanical strength of a semiconductor chip connection to a substrate. It would have been obvious to form a layer with a thickness of 1  $\mu\text{m}$  to 2  $\mu\text{m}$ , since that would provide a better thermal conductance.

As for claim 17, Komata et al disclose a solder composition with Sn: 12-37 wt% and Au: balance.

**(11) Response to Argument**

The appellants argue that the combination of references listed above do not disclose a direct joint of a semiconductor chip with a substrate through a hypereutectic gold-tin alloy having a layer thickness of about 1-2 $\mu\text{m}$ .

The examiner disagrees with the appellants because:

Yamagishi et al. disclose in fig. 1C a direct joint of a semiconductor chip 4 with a substrate 1 through a eutectic gold-tin alloy, but do not teach a hypereutectic gold-tin alloy with a thickness of about 1-2 $\mu\text{m}$ .

While Komata et al. disclose a gold-tin solder alloy having Sn: 12-37 wt% and Au: balance which would make the alloy a hypereutectic, Bacon et al. teach the advantage of a thin -- less than 5 $\mu\text{m}$  -- gold-tin solder.

Therefore, it would have been obvious to incorporate the teachings of Komata et al. and Bacon et al. with the device of Yamagishi et al, since that would provide gold-tin alloy with the lowest melting temperature for bonding applications and excellent thermal conductance.

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For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

ANS

February 8, 2003

Conferees

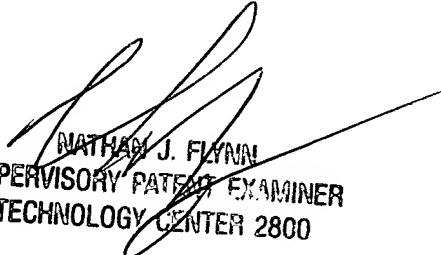
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